

Monitoring of municipal waste streams and their transformation into geopolymers



Ana Paula Ferreira da Silva

anapaula.silva@ipb.pt

Supervisor(s): Jose L. Diaz de Tuesta^{1,3}, José Alcides Peres², Helder T. Gomes¹

1. Centro de Investigação de Montanha (CIMO), Instituto Politécnico de Bragança, Campus de Santa Apolónia, 5300-253 Bragança, Portugal.
2. Centro de Química de Vila Real (CQVR), Universidade de Trás-os-Montes e Alto Douro, Quinta de Prados, 5001-801 Vila Real, Portugal.
3. Universidad Politécnica de Madrid (UPM) –Escuela Técnica Superior de Ingeniería de Montes, Forestal e do Meio Natural, Rúa de José Antonio Novais, 10, 28040 Madrid, Espanha

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2022 Annual Conference

Goals

As a new vision, MSWs can be valorized by transforming them into high added value products, such as geopolymer membranes (GPMs) for water treatment (WT) applications.

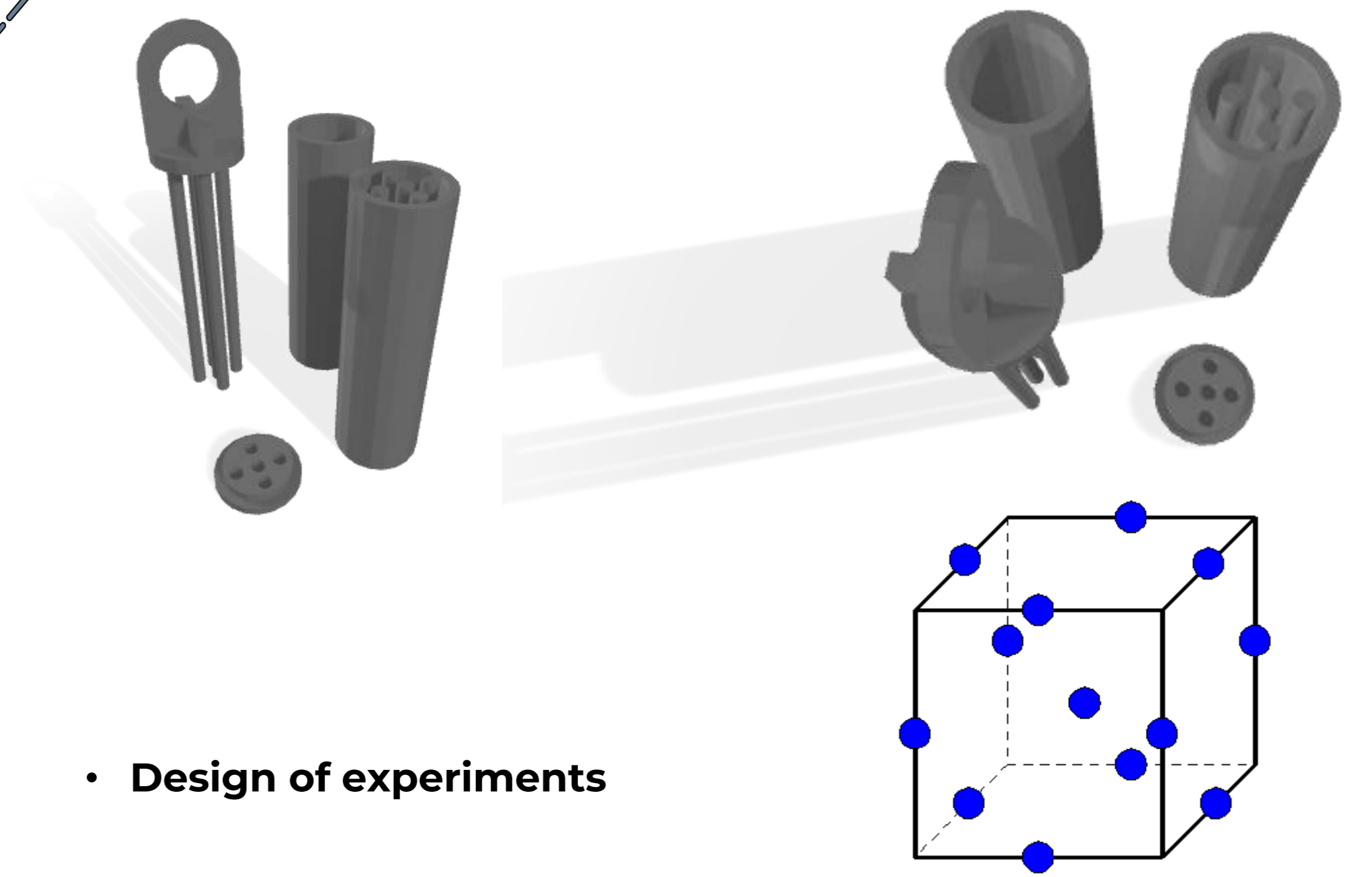
Geopolymers are aluminosilicates forming long-range, covalently bonded networks that have been largely explored as concrete replacers, but they may be molded to acquire any geometric shape, such as cylindrical membranes.

This research will focus on fabrication approaches of GPMs from matured compost obtained by biological and composting treatments of the organic fraction of MSWs for the development of clean technologies for solid waste management (SWM) in sustainable cities.

Two of the main issues big cities face are clean and safe water supply and efficient municipal solid waste (MSW) management.

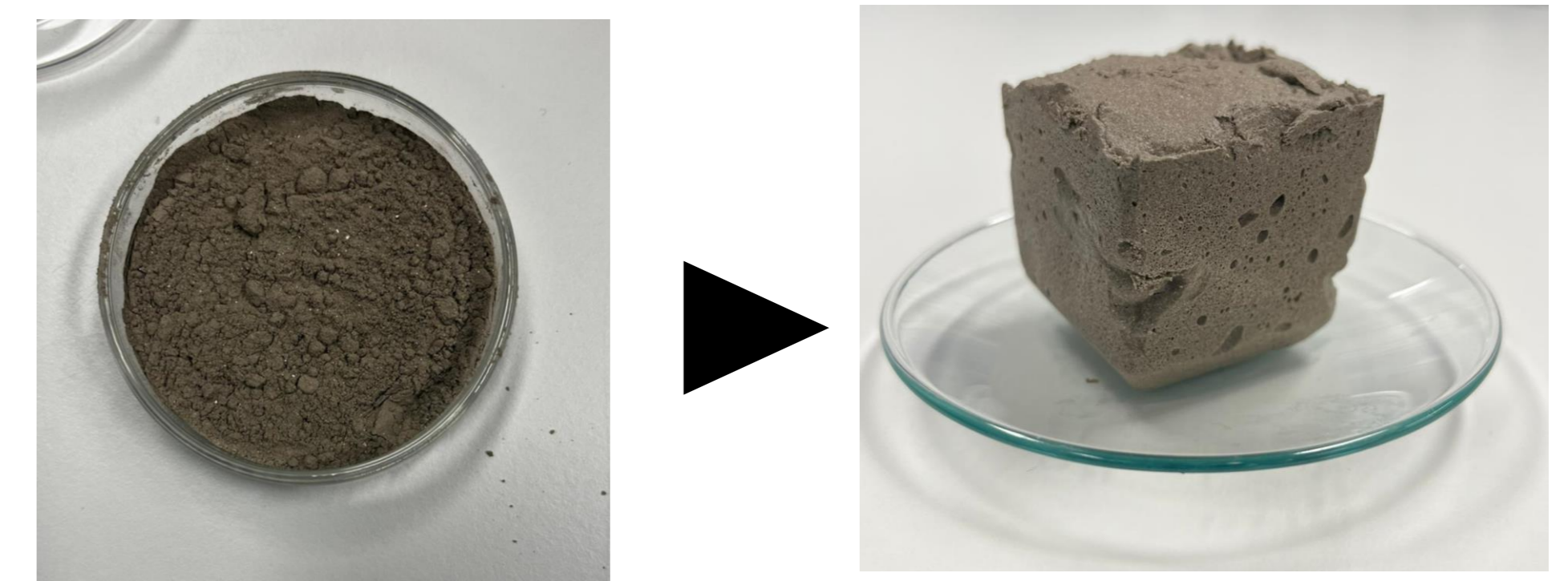


3rd • 3D mold printing for the production of geopolymer membranes



• Design of experiments

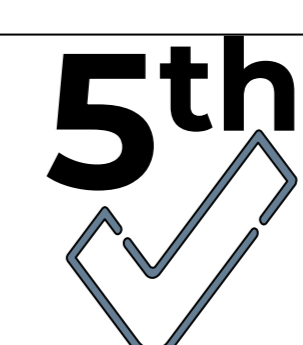
• Production of the first geopolymers from fly-ash (municipal solid waste combustion)



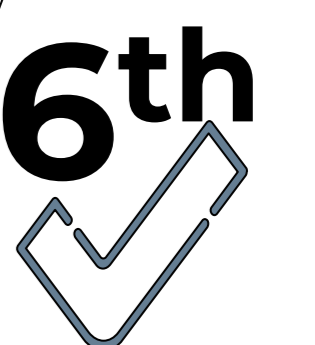
Future tasks



- 4th
- Fourier-transform infrared spectroscopy
 - X-ray diffraction
 - scanning electron microscopy
 - transmission electron microscopy
 - Textural properties

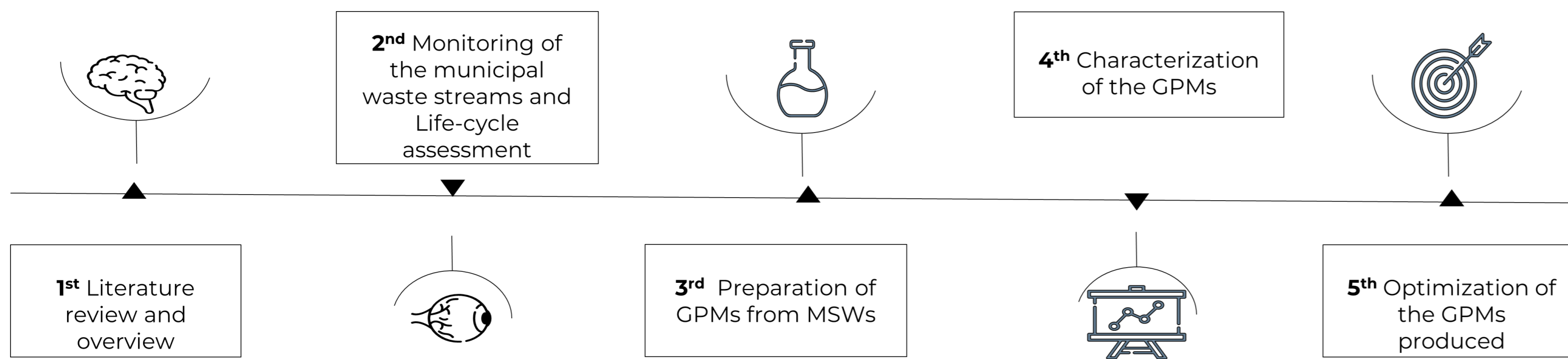


5th
Wastewater treatment - leachate

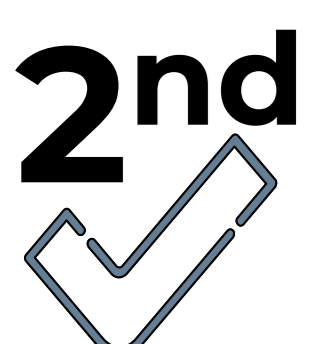


6th
Incorporation of activated carbons and CNTs

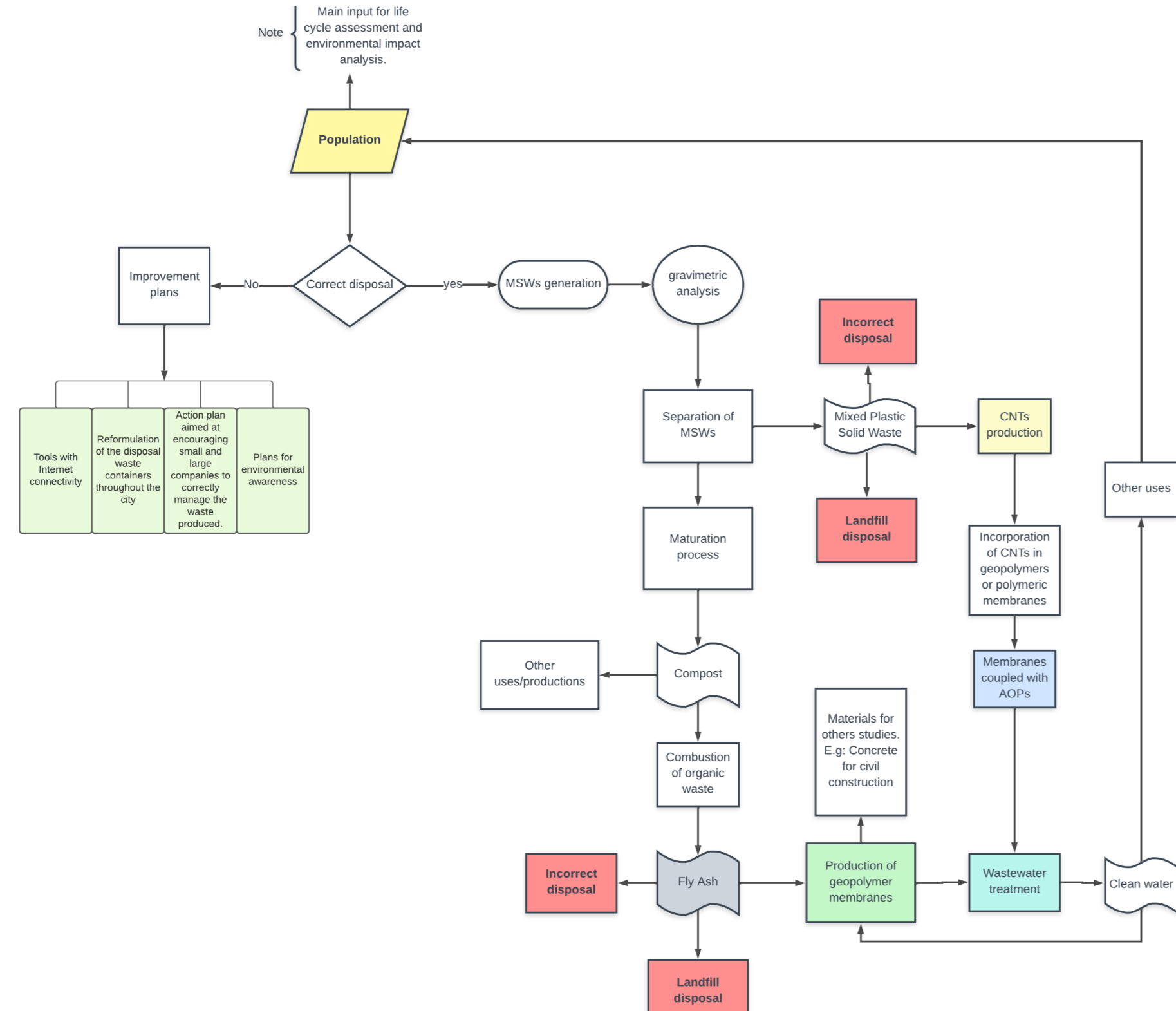
Tasks in progress



1st
Clarivate Analytics
WEB OF SCIENCE™
Scopus® 43 relevant articles cataloged



2nd Identification of inputs, outputs and necessary steps for LCA data collection



Expected outcomes



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FCT Fundação para a Ciência e a Tecnologia

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POLITÉCNICA

Sustainable Cities